



Relations of two Neotropical Rainforest Types in the Lowlands of the Amazon Basin at Rio Manú, Perú.

Zimmermann R ¹⁾, Oren R ²⁾, Terborgh J ²⁾

1) Jet Propulsion Laboratory, CALTECH-NASA, 4800 Oak Grove Drive, Pasadena CA 91109, USA

2) School of the Environment, Duke University, Durham NC 27708, USA

Abstract:

Two major forest types in the upper Amazonian headwater region are floodplain and upland (terra firme) forests. Floodplain forest (up to 60 m tall) develops on deep, recent alluvial deposits. Upland forest grows on adjacent hills with highly weathered soils and trees reach smaller proportions. To evaluate the effect of late dry season water supply on trees, the transpirational performance of 18 canopy and understory tree species at representative sites was monitored together with the diurnal patterns of stomatal conductance and plant water potential in a common understory species found in both forest types.

Trees did not access water as readily at the upland site as in the floodplain forest. Limited water availability at the upland site, combined with lower crown area index resulted in a ca. 30 % higher transpiration in the floodplain forest. In contrast to differences in tree transpiration found between the sites, stomatal conductance values were similar in the understory at both sites. A 100 mm rain event reduced the resistance to water uptake by trees in both forests. The upland forest experienced a larger change in water uptake, following the rain event than the floodplain forest, presumably as a consequence of the greater initial water stress in the upland forest. The water stress of the upland forest can be attributed to a clay hardpan 0.6 m below the surface that reduced the saturated conductivity of the soil by an order of magnitude. Thus, even in moist tropical climates, limited water supply may act to control the species composition and productivity of forests.

PK94. HA.DOC

To: David B. B. 7.94